



## **WATER RESOURCES RESEARCH GRANT PROPOSAL**

**Project ID:** 2002CO46G

**Title:** Occurrence and Fate of Emerging Organic Chemicals in Onsite Wastewater Systems and Implications on Water Quality Management in the Rocky Mountain Region

**Project Type:** Research

**Focus Categories:** Waste Water, Water Quality, Toxic Substances

**Keywords:** decentralized wastewater systems, onsite wastewater treatment, emerging organic chemicals

**Start Date:** 09/01/2002

**End Date:** 08/30/2004

**Federal Funds:** \$106,822

**Non-Federal Matching Funds:** \$113,470

**Congressional District:** 6th

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**Abstract**

The Rocky Mountain region has experienced significant development during the past decade, much of which is occurring in suburban fringe and mountain resort settings. In these areas, wastewater management is commonly achieved by onsite wastewater treatment systems (OWS). For example, in Colorado there are over 600,000 onsite systems in operation serving about 25% of the State's population and there are 7,000 to 10,000 new systems installed each year. On an annual basis this amounts to over 30 billion gallons of wastewater effluent discharged to the environment. In Wyoming, Montana, and Utah, the situation is similar. Issues have been raised regarding potential water quality impacts from onsite systems and the adequacy of current management practices to minimize such impacts. While concerns have been focused on nutrients and pathogens, emerging organic chemicals (EOCs), such as pharmaceuticals and personal care products, have received increasing attention. While several studies have pointed to wastewater as a primary contributing source of EOCs in the water environment, there is a dearth of information documenting the occurrence and fate of these compounds in onsite wastewater systems or the receiving waters to which they discharge. The proposed two-year project will be completed by the Colorado School of Mines in collaboration with USGS and consist of field monitoring and experimentation in Colorado to determine the occurrence and concentrations of EOCs in different types of onsite wastewater effluents, the removal efficiencies that can be expected in onsite wastewater treatment processes, and the occurrence of EOCs in surface waters where large numbers of onsite systems are present. The research proposed will benefit from ongoing research at CSM and USGS, including: (1) water quality assessment, modeling, and decision-support tool development in the Lake Dillon watershed in Summit County, Colorado, (2) field

monitoring of onsite wastewater system effluents and treatment performance with respect to nutrients and pathogens, and (3) testing and evaluation of onsite system treatment efficiency for nutrients and pathogens at a newly established test center on the CSM campus. Completion of the proposed research will provide important new information on the occurrence and fate of EOCs in onsite systems so that decision-makers can properly assess if there are any associated risks and if so, make informed judgments about what may be appropriate risk management strategies. While this study will be completed through field investigations and testing in Colorado, the results and information gained will have broad applicability to the management of water quality in the Rocky Mountain region as well as elsewhere in the U.S.